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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,339	01/18/2002	Santosh C. Lolayekar	MARA-01006US0 SBS	6530
28554 7590 01/18/2007 VIERRA MAGEN MARCUS & DENIRO LLP 575 MARKET STREET SUITE 2500 SAN FRANCISCO, CA 94105			EXAMINER LIN, WEN TAI	
			ART UNIT 2154	PAPER NUMBER

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.	Applicant(s)	
10/051,339	LOLAYEKAR ET AL.	
Examiner	Art Unit	
Wen-Tai Lin	2154	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-25 and 27-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-25 and 27-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1, 3-25 and 27-44 are presented for examination.
2. The text of those sections of Title 35, USC code not included in this action can be found in the previous office action.

Claim Rejections - 35 USC § 103

3. Claims 1, 3-4, 25, 27-28, 33 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al.(hereafter "Xu")[U.S. PGPub. 20030048792].
4. As to claim 1, Xu teaches the invention substantially as claimed including: a method for use in a network, the network including at least one initiator [e.g., 101, Fig.1], at least one storage device [i.e., inherently a targeted service node must be equipped with certain form of storage device such as memory and disk] and a storage switch [e.g., the switch router (Fig.2)] having a linecard [e.g., 221-224, Fig.2] connected to the at least one initiator and the at least one storage device for communication with the at least one initiator and the at least one storage device, the method comprising:

providing, by the linecard of the storage switch, quality of service to the at least one initiator for accessing the at least one storage device in the storage network [paragraphs 37-38 and 48-49; claim 1].

Xu does not specifically teach that the network is a storage network.

However Xu teaches that the switch router is designed for use in a networking infrastructure that links a wide variety of source nodes in a user domain to core and edge applications in a service domain comprising a core network [e.g., 104 Fig.1; paragraph 37].

It would have been obvious to one of ordinary skill in the art at the time the invention was made that Xu's switch router is also applicable to the storage network because: (1) Xu's switch router is readily applicable to providing QoS for users accessing the storage devices in the storage network; and (2) the switch router addresses the scalability and speed issues that are commonly encountered in accessing a storage network [paragraphs 6-8].

5. As to claims 3-4, Xu further teaches that the step of providing quality of service includes controlling the number of packets, or the number of requests, from the at least one initiator to the at least one storage device during a period of time [e.g., paragraph 43].

6. As to claim 25, Xu teaches the invention substantially as claimed including: a switch for use in a network, the switch having a linecard [e.g., Fig. 2] comprising:

a port [e.g., 201 Fig.2] to be coupled to an external device [e.g., 101 Fig.1], wherein the external device includes at least one of an initiator and a storage device [e.g., 101, Fig.1 and any service node within 104 of Fig.1]; and

a bandwidth controller [e.g., 301-304, Fig.3], the bandwidth controller including a processor [e.g., 201, Fig.2], a traffic manager [e.g., 331, Fig.3], and a buffer [e.g., 321, 341 Fig. 3].

R1 does not specifically teach that the network is a storage network.

However Xu teaches that the switch router is designed for use in a networking infrastructure that links a wide variety of source nodes in a user domain to core and edge applications in a service domain comprising a core network [e.g., 104 Fig.1; paragraph 37].

7. It would have been obvious to one of ordinary skill in the art at the time the invention was made that Xu's switch router is also applicable to the storage network because: (1) Xu's switch router is readily applicable to providing QoS for users accessing the storage devices in the storage network; and (2) the switch router addresses the scalability and speed issues that are commonly encountered in accessing a storage network [paragraphs 6-8].

8. As to claim 27, Xu further teaches that the processor is a storage processor [when the processor involves in the management of the accessing data in a storage network, it may be called a storage processor].

9. As to claim 28, Xu further teaches that that the port and the bandwidth controller are on one of a plurality of linecards in the switch, wherein each linecard includes a respective port and a respective bandwidth controller [Figs. 2-3].

10. As to claims 33 and 35-36, since the features of these claims can also be found in claims 1, 25 and 27, they are rejected for the same reasons set forth in the rejection of claims 1, 25 and 27 above.

11. Claims 1, 3-4, 25, 27-28, 33 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guha et al.(hereafter "Guha")[U.S. 20020194324] in view of Xu et al.(hereafter "Xu")[U.S. PGPub. 20030048792].

12. Guha was cited in the previous office action.

13. As to claim 1, Guha teaches the invention substantially as claimed including: a method for use in a storage network, the storage network including at least one initiator [e.g., 5, Fig.1], at least one storage device and a storage switch [e.g., LIC of Fig.1, wherein the LIC including a storage subsystem and a storage switch] in communication with the at least one initiator and the at least one storage device, the method comprising:

providing, by the storage switch, quality of service to the at least one initiator for accessing the at least one storage device in the storage network [paragraphs 40-45; note that it is clear by comparing the elements in Figs. 1 and 4, the storage switch (i.e., LIC of Fig.1 less the servers and storage subsystem) provides the functionalities of 36, 34, 38 and 42 of Fig.4].

Guha does not specifically teach that the above functions are implemented on a linecard.

However, implementing electronic circuitries on linecards is well known in the art. For example, in the same field of endeavor, Xu teaches implementing a switch router (i.e., a storage switch) on at least with the above functionalities [Figs. 1-4; paragraphs 37-38 and 48-49].

It would have been obvious to one of ordinary skill in the art at the time the invention was made that Xu could have implement the storage switch as linecards because it facilitates the modularization of a system and simplifies maintenance by interfacing the linecards to a common backplane.

14. As to claims 3-4, Guha further teaches that the step of providing quality of service includes controlling the number of packets, or the number of requests, from the at least one initiator to the at least one storage device during a period of time [e.g., paragraphs 19 and 25; note that “controlling the number of packets ... during a period of time” is mapped to the feature of “updating a content request traffic profile” in Guha’s

content controller, wherein the number of packets and the number of requests are equivalent because each request constitutes a packet].

15. As to claims 25 and 28, Guha teaches the invention substantially as claimed including: a switch for use in a storage network [e.g., Fig.4; paragraph 63], the switch comprising:

a port [e.g., any port of the SAN switch] to be coupled to an external device, wherein the external device includes at least one of an initiator and a storage device [e.g., 39-40 and 42, Fig.4 are external devices when functional blocks 34, 36, 38 and 42 of Fig. 4 are included in the switch]; and

a bandwidth controller [e.g., 36, Fig.4], the bandwidth controller including a processor, a traffic manager, and a buffer [paragraphs 73-74; note that Guha teaches using a computer to implement the steps outline din Fig.8, wherein the content controller functions as a bandwidth controller. Being a computer, it is inherent that there must be a processor, a traffic manager program for performing the steps of Fig.8, and a buffer for holding temporary data].

Guha does not specifically teach that the above functions are implemented on a linecard.

However, implementing electronic circuitries on linecards is well known in the art. For example, in the same field of endeavor, Xu teaches implementing a switch router (i.e., a storage switch) on at least with the above functionalities [Figs. 1-4; paragraphs 37-38 and 48-49].

It would have been obvious to one of ordinary skill in the art at the time the invention was made that Xu could have implement the storage switch as linecards because it facilitates the modularization of a system and simplifies maintenance by interfacing the linecards to a common backplane.

16. As to claim 27, Guha further teaches that the processor is a storage processor [since the processor involves management of the SAN storage devices, it may be called a storage processor].

17. As to claim 33, Guha teaches the invention substantially as claimed including: a storage switch for use in a storage network comprising:

a first port to be coupled to at least one initiator [e.g., the port of the SAN switch in 1 of Fig.1 connected to 5 of Fig.1];

a second port to be coupled to at least one storage device [e.g., another port of the SAN switch connected to any of the storage device in Fig. 1; see also Fig.4 for details]; and means for providing quality of service for a connection from the at least one initiator to the at least one storage device in the storage network [e.g., paragraphs 67-68].

Guha does not specifically teach that the above functions are implemented on a linecard.

However, implementing electronic circuitries on linecards is well known in the art. For example, in the same field of endeavor, Xu teaches implementing a switch router

(i.e., a storage switch) on at least with the above functionalities [Figs. 1-4; paragraphs 37-38 and 48-49].

It would have been obvious to one of ordinary skill in the art at the time the invention was made that Xu could have implement the storage switch as linecards because it facilitates the modularization of a system and simplifies maintenance by interfacing the linecards to a common backplane.

18. As to claims 35-36, since the features of these claims can also be found in claims 25, 27 and 33, they are rejected for the same reasons set forth in the rejection of claims 25, 27 and 33 above.

19. Claims 9, 15 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guha et al.(hereafter "Guha")[U.S. 20020194324], as applied to claims 1, 3-8, 16-21, 25, 27-29 and 33-37 above and Elesson et al.(hereafter "Elesson")[U.S. 6459682], as applied to claims 6-8, 16-21, 29, 34 and 37 above, and further in view of Xu et al.(hereafter "Xu")[U.S. PGPub. 20030048792], as applied to claims 1, 3-8, 16-21, 25, 27-29 and 33-37 above.

20. As to claim 9, Guha teaches the invention substantially as claimed including: a method for use in a storage network, the storage network including at least one initiator, at least one storage device, and at least one storage switch, wherein the at least one initiator and the at least one storage device are both in communication with the storage

switch [e.g., LIC of Fig.1; paragraphs 40-45, wherein the LIC including a storage subsystem and a storage switch], the method comprising:

guaranteeing, by the storage switch, a minimum bandwidth to the at least one initiator to access the at least one storage device in the storage network [Elesson: col.1, lines 49-52; col.5 line 48- col.6 line 26]; and

measuring, by the storage switch [i.e., the egress device in Elesson's system], an actual bandwidth utilized by the at least one initiator, where the actual bandwidth is measured by a number of requests per second times an average size of requests from the at least one initiator [e.g., Elesson: claim 18; i.e., "monitoring traffic ... at each of a plurality of edge devices" can be accomplished by measuring the number of request times an average size of requests].

[See motivation for the combination of Guha and Elesson in the rejection of claim 6 above]

Guha does not specifically teach that the above functions are implemented on a linecard.

However, implementing electronic circuitries on linecards is well known in the art. For example, in the same field of endeavor, Xu teaches implementing a switch router (i.e., a storage switch) on at least with the above functionalities [Figs. 1-4; paragraphs 37-38 and 48-49].

It would have been obvious to one of ordinary skill in the art at the time the invention was made that Xu could have implement the storage switch as linecards

because it facilitates the modularization of a system and simplifies maintenance by interfacing the linecards to a common backplane.

21. As to claim 15, Guha and Elesson does not specifically teach that estimating the actual bandwidth includes determining if a buffer includes a number of packets beyond a specified threshold.

However, Elesson teaches that when traffic belonging to certain service-level is found to be in violation of an assigned traffic rate (e.g., bandwidth usage beyond allocated level), corresponding actions would be dropping packets, buffering packets, or downgrading packets to a different service-level, etc [col.8 lines 40-58].

Thus, it would have been obvious to one of ordinary skill in the art to realize that when the buffered packets keep coming, a threshold must be set up to consider further actions (such as dropping the incoming packets or downgrading packets to a different service level) if the buffered packets reach to the threshold because buffers are limited in size and a threshold is required to avoid packets from overflowing the buffer.

22. As to claim 30, since the features of this claim can also be found in claims 9 and 15, it is rejected for the same reasons set forth in the rejection of claims 9 and 15 above.

23. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guha et al.(hereafter "Guha")[U.S. 20020194324], as applied to claims 1, 3-4, 25, 27-28, 33 and

35-36 above and Xu et al.(hereafter "Xu")[U.S. PGPub. 20030048792], as applied to claims 1, 3-4, 25, 27-28, 33 and 35-36 above, further in view of Connor [U.S. PGPub. 20020087714].

24. As to claim 5, Guha does not specifically teach that the step of providing quality of service includes adjusting a number of concurrent requests allowed to be sent by the at least one initiator.

However, in the same field of endeavor Connor teaches a client-side throttling method for limiting the number of concurrent requests to be sent to the content server [paragraph 33].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adopt Connor's method in Guha's system as a measure for controlling the requests arriving at the content servers because throttling at the client side is a more effective effort without having to drop a client's requests when the system could not handle all the concurrent content requests [for motivations see, e.g., Guha: paragraphs 4-6, 9 and Connor: paragraph 34].

25. Claims 6-8, 10-14, 16-24, 29, 34 and 37-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guha et al.(hereafter "Guha")[U.S. 20020194324], as applied to claims 1, 3-5, 25, 27-28, 33 and 35-36 above, Xu et al.(hereafter "Xu")[U.S. PGPub. 20030048792], as applied to claims 1, 3-5, 25, 27-28, 33 and 35-36 above and

Connor [U.S. PGPub. 20020087714], as applied to claim 5 above, further in view of Elesson et al.(hereafter "Elesson")[U.S. 6459682].

26. As to claim 6, Guha teaches that the step of providing quality of service includes implementing a service level agreement (SLA) by applying QoS rules according to the observed traffic [paragraph 20].

Guha and Connor does not specifically teach adjusting the number of requests allowed the at least one initiator to keep the bandwidth utilized by the at least one initiator within a specified range.

However, Elesson teaches a QoS policy to maintain the bandwidth utilization of each client (according to the SLA) by regulating congested traffic channels to within specified bounds via, e.g., access control [col.1, lines 49-52; col.5 line 48- col.6 line 26].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Elesson's QoS rules to Guha and Connor's content service system by throttling each user's request such that the SLA-allowed bandwidth utilization can be controlled within a specified range (according to the SLA) because network bandwidth is a well known parameter characterizing network traffic and by adjusting the number of requests submitting from the client side, it could avoid dropping overflowed packets and results more efficient use of the network resources [Guha: paragraph 68].

27. As to claim 7, Guha, Connor and Elesson further teach the step of providing quality of service includes:

guaranteeing a minimum bandwidth to the at least one initiator to access the storage device [Elesson: col.5 lines 48-54, wherein the “guaranteeing a minimum bandwidth” is mapped to keeping the traffic flow to within specified bounds – i.e., the lower bound being a guaranteed minimum traffic or bandwidth];

estimating an actual bandwidth utilized by the initiator, where the actual bandwidth is estimated by a number of requests per second times an average size of requests from the at least one initiator [e.g., Elesson: claim 18; i.e., “monitoring traffic ... at each of a plurality of edge devices” can be accomplished by measuring the number of request times an average size of requests]; and

adjusting a number of concurrent requests allowed to be sent by the at least one initiator [Connor: paragraph 33; see motivation for the combination of Guha, Connor and Elesson in the rejection of claims 5-6 above].

28. As to claim 8, Guha, Connor and Elesson further teach :

guaranteeing up to a maximum bandwidth to the at least one initiator to access the at least one storage device [Elesson: col.5 lines 48-54, wherein the “guaranteeing a maximum bandwidth” is mapped to keeping the traffic flow to within specified bounds – i.e., the upper bound being a guaranteed maximum traffic or bandwidth];

wherein adjusting the number of concurrent requests includes reducing the number of concurrent requests allowed by the at least one initiator when the actual bandwidth exceeds the maximum bandwidth Connor: paragraph 33; note that Connor’s throttling process includes reducing/increasing the number of concurrent requests

allowed by the at least one initiator when the actual bandwidth exceeds/falls below the maximum/minimum bandwidth or traffic].

29. As to claim 16, since the features of this claim can also be found in claims 9, it is rejected for the same reasons set forth in the rejection of claims 9 above.

30. As to claim 20, Guha further teaches that the targets are virtual targets [paragraph 60; i.e., the virtual storages].

31. As to claims 10-14, 17-19, 21-24, 29, 34 and 37-44, since the features of these claims can also be found in claims 1, 7-9, 13-16, 25 and 33, they are rejected for the same reasons set forth in the rejection of claims 1, 7-9, 13-16, 25 and 33 above.

32. Claims 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guha et al.(hereafter "Guha")[U.S. 20020194324], as applied to claims 1, 3-21, 25, 27-29 and 33-44 above, Xu et al.(hereafter "Xu")[U.S. PGPub. 20030048792], as applied to claims 1, 3-21, 25, 27-29 and 33-44 above and Elesson et al.(hereafter "Elesson")[U.S. 6459682], as applied to claims 6-21, 29, 34 and 37-44 above, and further in view of Connor [U.S. PGPub. 20020087714], as applied to claims 5-8, 10-14, 16-21, 29, 34 and 37-44 above.

33. As to claims 31-32, since the features of these claims can also be found in claims 1, 5-6, 9, 25 and 29-30, they are rejected for the same reasons set forth in the rejection of claims 1, 5-6, 9, 25 and 29-30 above.

34. Applicant's arguments with respect to claims 1, 3-25 and 27-44 on 11/27/2006 have been considered but are moot in view of the new ground(s) of rejection.

35. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

36. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Examiner note: Examiner has cited particular columns and line numbers in the references as applied to the claims above for the convenience of the applicant.

Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wen-Tai Lin whose telephone number is (571)272-3969. The examiner can normally be reached on Monday-Friday(8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee can be reached on (571)272-3964. The fax phone numbers for the organization where this application or proceeding is assigned are as follows:

(571) 273-8300 for official communications; and

(571) 273-3969 for status inquiries draft communication.

Art Unit: 2154

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wen-Tai Lin

January 15, 2007

Wen Tai Lin
1/15/07